

ABSTRACT

A Gigabit Ethernet-based passive optical network that can reliably transmit data is disclosed. The network includes an OLT for receiving a public key through a transmission
5 medium, encrypting a secret key by means of the received public key, transmitting the encrypted secret key, encrypting data by means of the secret key, and transmitting the encrypted data, the OLT being located in a service provider-side. The network also includes an ONT for transmitting the public key to the OLT, receiving the secret key transmitted from the OLT, decrypting the secret key by means of a private key, receiving the data, and
10 decrypting the received data by means of the decrypted the secret key. The public key is used for encrypting the secret key. The secret key is encrypted by means of the public key. The data is encrypted by the OLT by means of the secret key.